What is the Language of Unique Identification (UID)?

A DoD Unique Identifier (UID) permanently identifies an individual item distinctly from all other individual items that DoD buys and owns. See Table 1 for what a DoD UID is and is not.

A UID Is	A UID Is Not
✓ A Data Element ✓ A Unique Identifier for an Item ✓ Globally Unique ✓ Unambiguous ✓ Permanent ✓ Created by Concatenating Specific Data Elements	✓ A Medium for Communicating Data, such as Radio Frequency Identification (RFID) Tags, Contact Memory Buttons, Linear Bar Codes, or 2-D Data Matrices ✓ A Replacement for the National Stock Number ✓ Intelligent Data that Yields Information About the Item

Table 1

With the UID, the DoD can associate valuable business intelligence with an item throughout its life cycle and accurately capture and maintain data for valuation and tracking of items.

What does a DoD UID Mark Look Like?

Recognizing the need for high data capacity and direct part marking capability, the DoD UID mark, as contained in MIL-STD-130L, is data matrix, a high density 2 dimensional matrix style bar code symbology that can encode up to 3116 characters from the entire 256 byte ASCII character set. The symbol is built on a square or rectangular grid arranged with a finder pattern around the perimeter of the bar code symbol. A data matrix symbol looks like this. Obviously, it is not possible for the human eye to read what has been encoded in the data matrix symbol.

How is the DoD UID Mark Read?

Automatic identification technology (AIT) is used to mark (or write) the UID data elements within the data matrix symbol on an item and to read the UID, using an automated reader. To do this, the data elements have to be described to the AIT device by a prefix used to represent instructions to the device. These "prefixes" are known as data qualifiers, referred to as semantics. "Data qualifier" means a specified character (or string of characters) that immediately precedes a data field that defines the general category or intended use of the data that follows. Data qualifiers can take one of three forms in commercial use: alphanumeric Data Identifiers (DI), numeric Application Identifiers (AI), or alpha Text Element Identifiers (TEI). For additional information on data qualifiers to be used in DoD UID, refer to the DoD Guide to Uniquely Identifying Items at http://www.acq.osd.mil/uid.

How do You Build a DoD UID?

There are two methods to construct the UID for an item. These methods are: (1) Serialization within the Enterprise Identifier, called Construct #1, and (2) Serialization within the Original Part Number (within the enterprise identifier), called Construct #2. The UID data elements for Construct #1 and Construct #2 are summarized in Table 2.

	UID Construct #1	UID Construct #2
Based on current enterprise configurations	If items are serialized within the Enterprise	If items are serialized within Part Number
UID is derived by concatenating the data elements IN ORDER:	Issuing Agency Code* Enterprise ID Serial Number	Issuing Agency Code* Enterprise ID Original Part Number Serial Number
Data Identified on Assets Not Part of the UID (Separate Identifier)	Current Part Number	Current Part Number
*The Issuing Agency Code (IAC) represents the registration authority that issued the enterprise identifier (e.g., Dun and Bradstreet, EAN.UCC). The IAC can be derived from the data qualifier for the enterprise identifier and does not need to be marked on the item.		

Table 2

The concatenated UID is not normally marked on the item because the UID can be constructed from its component data elements each time the data matrix symbol is read, as long as those elements are contained in the data matrix. The current part number is not part of the UID. It is an additional, separate data element. Table 3 shows the data qualifiers to be used in constructing the UID.

Semantics Translation Between Data Identifiers (DI), Application Identifiers (AI), and Text Element Identifiers (TEI)

Enterprise ID	DI	AI	TEI
CAGE/NCAGE	17V		CAG, MFR or SPL
DUNS	12V		DUN*
EAN.UCC	3V	95	EUC*
Serial No. w/in Enterprise Identifier			SER or UCN
Serial No. w/in Original Part No.	S	21	SEQ*
Original Part No.	1P	01	PNO*
Unique Identifier (With IAC)	25S	8004	
Item Identifier (Without IAC)	18S**		UID*, USN or UST
Current Part No.	30P	240	PNR

* Usage pending Air Transport Association approval of these TEIs
**Usage pending ANSI MH 10.8 approval

Table 3

How are the Building Blocks' Data Elements Put Together?

Once the data elements are identified to the AIT device, the AIT device needs instructions on how to put the data element fields together to create the UID. The instructions are referred to as message syntax. For items that require a UID, DoD requires syntax that follows ISO/IEC 15434, Information Technology – Syntax for High Capacity ADC Media. Standard syntax is crucial to the UID, since the process of identifying and concatenating the data elements must be unambiguous.

Figure 1 shows examples of the data elements and Data Identifiers that are placed on the item within the Data Matrix symbol. The ISO/IEC 15434 syntax encoded in the data matrix, using ISO/IEC 15418 (MH10.8.2 Data Identifiers), for Construct #1 is [)>$^{R}_{S}$06$^{G}_{S}$18S0CVA5786950$^{R}_{S}$^{E}o$_{T}$. For Construct #2, the encoded syntax is [)>$^{R}_{S}$06$^{G}_{S}$12V194532636$^{G}_{S}$1P1234$^{G}_{S}$S786950$^{R}_{S}$^{E}o$_{T}$. The figure further shows how the AIT devices would output the data elements in a concatenated UID according to the syntax instructions. Notice that the UID data elements contained in the Data Matrix symbol can also be included on the item in human readable form.

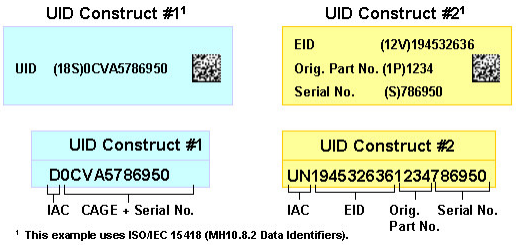

Figure 1

Figure 2 shows an example of the data elements and Application Identifiers that are placed on the item within the Data Matrix symbol. When using EAN.UCC Application Identifiers (ISO/IEC 15418) for purposes of unique identification, enterprises must use the General EAN.UCC Specifications to construct the unique identifier. Within the General EAN.UCC Specifications, the Global Individual Asset Identifier (GIAI) is considered a UID equivalent. The application identifier (8004) indicates that the data field contains a GIAI. The GIAI is made up of the EAN.UCC Company Prefix and an individual asset reference number. This is equivalent to the UID Construct #1. The data is encoded as follows under Format 05 for Application Identifiers of the ISO/IEC 15434 syntax: [)>$^{R}_{S}$05$^{G}_{S}$80040614141 1A0B9C3D6$^{R}_{S}$^{E}o$_{T}$. For Construct #2, the encoded syntax is [)>$^{R}_{S}$05$^{G}_{S}$0100614141999996$^{G}_{S}$211A0B 9C3D6$^{R}_{S}$^{E}o$_{T}$. The figure further shows how the AIT devices would output the data elements in a concatenated UID according to the syntax instructions.

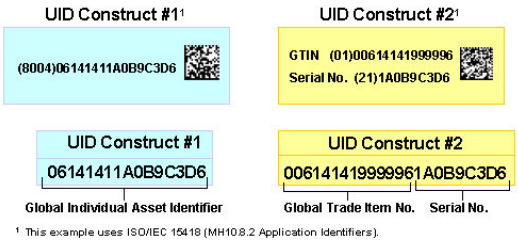

Figure 2

Figure 3 shows examples of the data elements and Text Element Identifiers that are placed on the item within the Data Matrix symbol. The ISO/IEC 15434 syntax encoded in the data matrix, using the DD format of the DoD collaborative solution, for Construct #1 would be [)>$^{R}_{S}$DD$^{G}_{S}$MFR 0CVA5$^{G}_{S}$SER 786950$^{R}_{S}$^{E}o$_{T}$. Available Text Element Identifiers do not permit use of Construct #2. The figure further shows how the AIT devices would output the

data elements in a concatenated UID according to the syntax instructions.

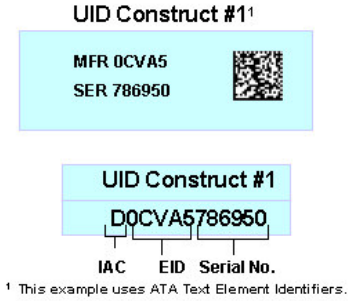

Figure 3

Recognized DoD UID Equivalents

A commercial identifier can be considered for use as a DoD UID equivalent if it meets all of these criteria: (1) Must contain an enterprise identifier, (2) Must uniquely identify an individual item within an enterprise identifier, product or part number, and (3) Must have an existing Data Identifier (DI) or Application Identifier (AI) listed in American National Standard (ANS) MH10.8.2, Data Identifier and Application Identifier Standard. The commercial unique identifiers meeting these criteria that the Department recognizes as UID equivalents are the EAN.UCC Global Individual Asset Identifier (GIAI) for serially-managed assets, the EAN.UCC Global Returnable Asset Identifier (GRAI) for returnable assets, the ISO Vehicle Identification Number (VIN) for vehicles, and the Electronic Serial Number (ESN) for cellular telephones only.

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